

WATER TUBE STEAM BOILERS

STEAM SUPERHEATERS
CHAIN GRATE STOKERS



THE
BABCOCK & WILCOX CO.
NEW YORK - LONDON

BRANCH OFFICES
SAN FRANCISCO SHELDON BLDG.
CHAS. C. MOORE
PACIFIC COAST MANAGER
SEATTLE LOS ANGELES
PORTLAND TUCSON
SALT LAKE

WATER TUBE STEAM BOILERS

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CHAIN GRATE STOKERS



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Works

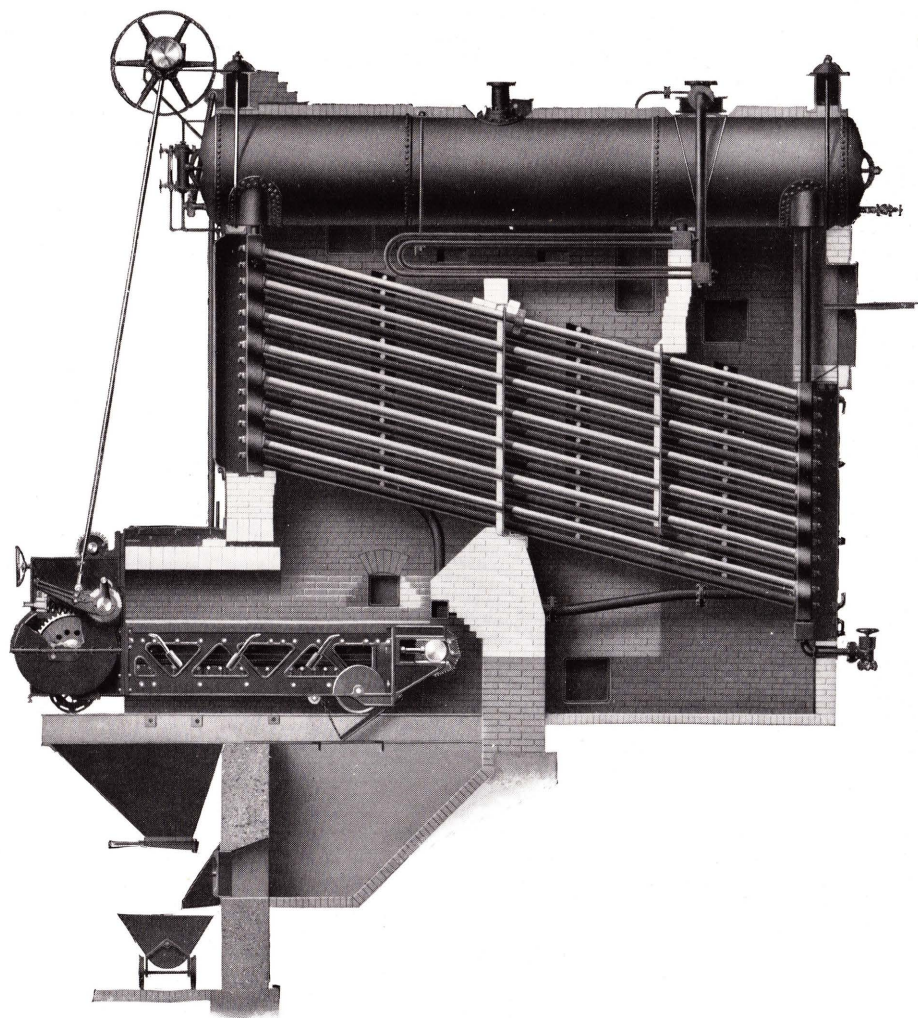
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WROUGHT-STEEL VERTICAL HEADER BABCOCK & WILCOX BOILER EQUIPPED
WITH BABCOCK & WILCOX SUPERHEATER AND BABCOCK & WILCOX
CHAIN GRATE STOKER

THE BABCOCK & WILCOX BOILER

THE wrought-steel Babcock & Wilcox boiler as built to-day represents the highest state of development in boiler construction. It fulfills in every particular the requirements of the perfect steam boiler set forth by George H. Babcock and Stephen Wilcox in 1875. These requirements have been too often quoted and are too well known to need repetition here.

The heating surface of the boiler is made up of drums extending longitudinally over the other pressure parts. To the drums there are connected, through forged-steel cross boxes at either end, the sections made up of headers and tubes. At the lower end of the sections there is a mud drum extending entirely across the boiler and connected to all of the sections. The connections between all parts are made by short lengths of tubes expanded into bored seats.

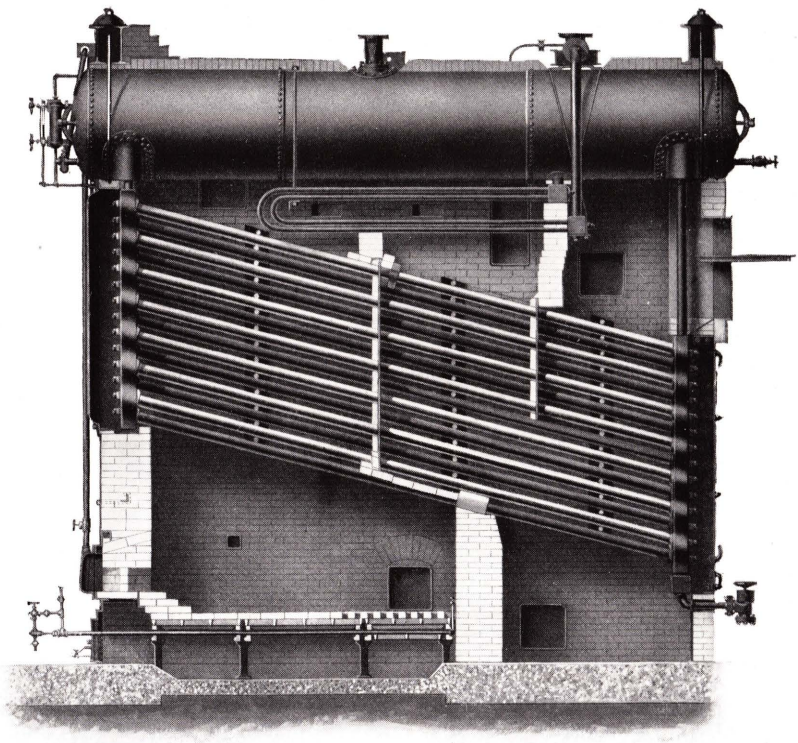
The headers into which the tubes are expanded are of forged steel and are of serpentine or sinuous form so that the tubes are disposed in a staggered position when assembled as a complete boiler. This staggering of the tubes breaks up the gases and causes them to impinge on every tube.

Opposite each tube end in the headers there is placed a handhole of sufficient size to permit the inspection, cleaning or renewal of a tube. These handholes are closed by suitable handhole fittings.

All Babcock & Wilcox boilers are built with a factor of safety of at least five.

The gases of combustion are caused to make three passes over the heating surfaces by baffles constructed of special baffle brick and cast-iron flame plates.

The form of the furnace is such that it is readily adaptable to the fuel available, whether solid, liquid or gaseous.



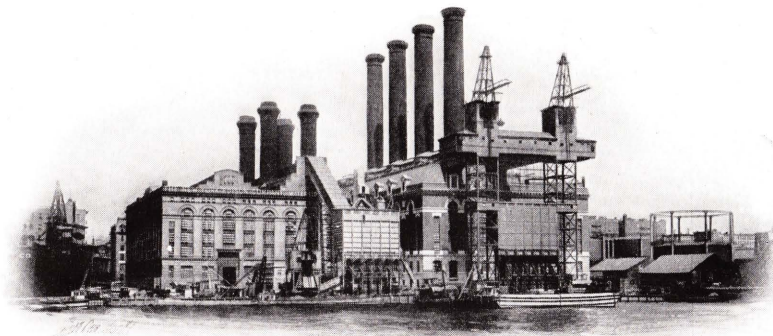
WROUGHT-STEEL VERTICAL HEADER BABCOCK & WILCOX BOILER EQUIPPED
WITH BABCOCK & WILCOX SUPERHEATER AND PEABODY
PATENTED OIL FURNACE

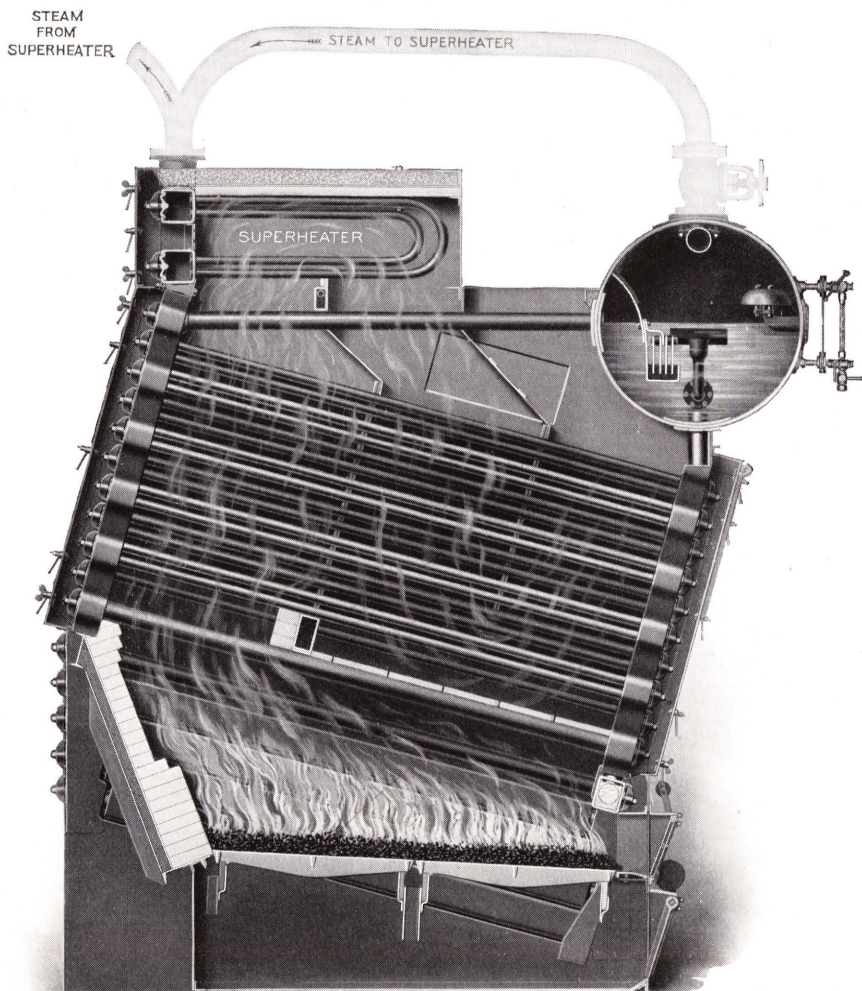
Boilers are suspended front and rear from wrought-steel supporting frames, entirely independent of the brickwork. This method of support allows for expansion and contraction of the pressure parts without straining either the boiler or the brickwork, and also permits of brickwork repair or renewal without disturbing in any way the boiler or its connections.

The boiler fronts are of ornamental design. With each boiler there is furnished a complete set of fittings and boiler fixtures.

Patented dusting doors furnish a means of keeping all portions of the heating surfaces free from soot and dust. Large doors in the sides of the setting give full access to all parts for inspection and for the removal of any accumulation of soot.

Probably the best evidence of the value of the Babcock & Wilcox boiler as a steam generator and the reliability of the apparatus under any conditions of service is the fact that there are installed throughout the world, in plants representing every known industry, over 10,000,000 horse power of Babcock & Wilcox boilers.





BABCOCK & WILCOX MARINE BOILER EQUIPPED WITH
BABCOCK & WILCOX SUPERHEATER

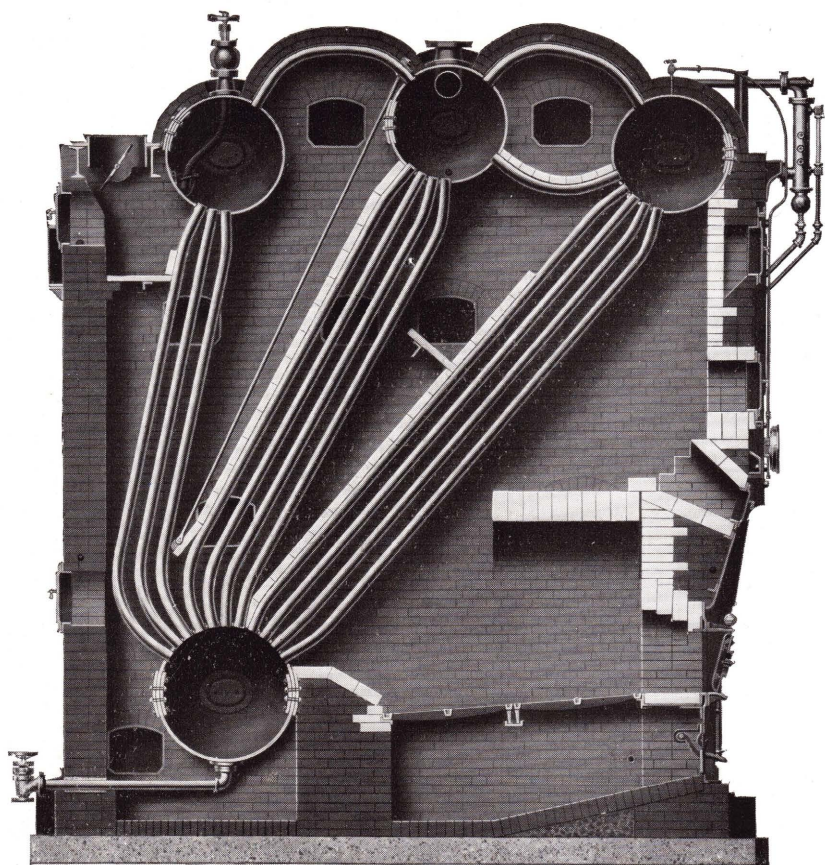
Where the weight of the boiler is not so important and an unusually rugged construction is desired, a variation known as the Dredge Type is used. The general design is the same as that of the marine boiler but the tubes are longer and of larger diameter. A great many of these boilers have been installed and have given great satisfaction under the most severe conditions of service.

The illustration shows a Babcock & Wilcox marine boiler equipped with a marine superheater, and the simplicity and ease of installation of this superheater are apparent. An increase of economy by the use of superheated steam may be obtained varying from 5 to 10 per cent, depending upon the ratio of superheating to evaporating surface.

BABCOCK & WILCOX MARINE BOILERS INSTALLED AND ON ORDER

United States and Foreign Navies, horse power	2,800,000
Merchant Steamers, all countries, horse power	600,000
Pacific Coast Vessels, horse power	204,580





STIRLING BOILER

THE STIRLING BOILER

THE Stirling boiler consists of three transverse steam and water drums set parallel and connected to a mud drum by three banks of water tubes so curved as to enter the drums radially. The steam space of the center drum, from which steam is taken, is connected to the front and rear drum by steam circulating tubes and to the front drum by water circulating tubes. All pressure parts are built with a factor of safety of at least five.

The tubes are so spaced as to allow the removal of any tube without disturbing any other tube or the brickwork.

The furnace is formed by the use of a firebrick arch sprung across the boiler setting in the triangular space formed by the front wall and the front bank of tubes. This furnace readily lends itself to the installation of any stoker and the burning of any class of fuel.

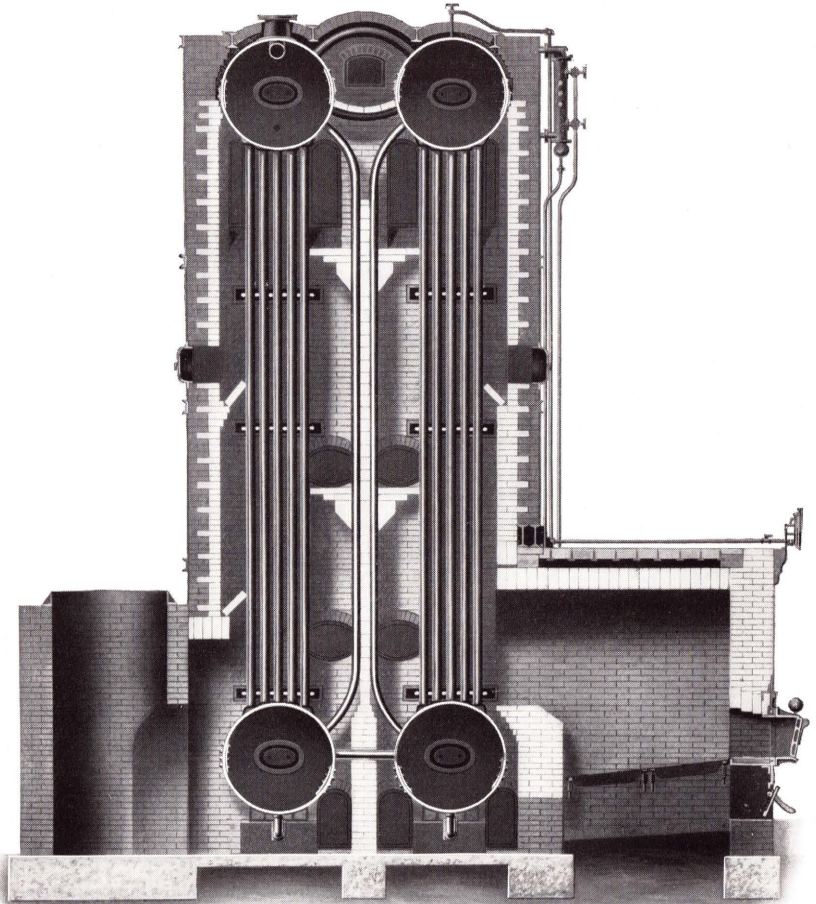
The gases of combustion are led from the furnace over the heating surface by two baffles of firebrick tile, one resting on the rear row of tubes of the front bank and the other supported on the rear row of tubes of the second bank.

The boiler is supported on a wrought-iron framework entirely independent of the brickwork setting.

The boiler front is of ornamental design. Each boiler is equipped with a full set of substantial and well-designed fittings and boiler fixtures.

Large cleaning doors in the sides of the setting give ready access to all portions for cleaning, inspection and repair.

Details of the Stirling boiler have been developed after years of careful observation on the part of competent engineers. That there are in service, in plants of every description where steam is used, over 3,500,000 horse power of Stirling boilers clearly demonstrates the right of the boiler to all of the claims of excellence that have been made for it.



RUST BOILER

THE RUST BOILER

THE Rust boiler is made up of two transverse steam and water drums and two transverse mud drums connected by banks of tubes. Each steam drum is connected to the mud drum directly below it by five rows of straight tubes and one row of curved tubes. The steam drums are connected by curved steam and water circulating tubes and the mud drums by water circulating tubes.

The tube sheets of all drums are pressed to form individual tube seats, thus permitting straight tubes to be expanded directly into the cylindrical drums. This construction is patented. All pressure parts are built with a factor of safety of at least five.

The tubes are staggered and are so arranged that any tube may be removed without disturbing any other tube or the boiler brickwork.

The furnace is of the extension or Dutch oven type and being distinct from the boiler setting proper, enables any type of furnace or any fuel to be used.

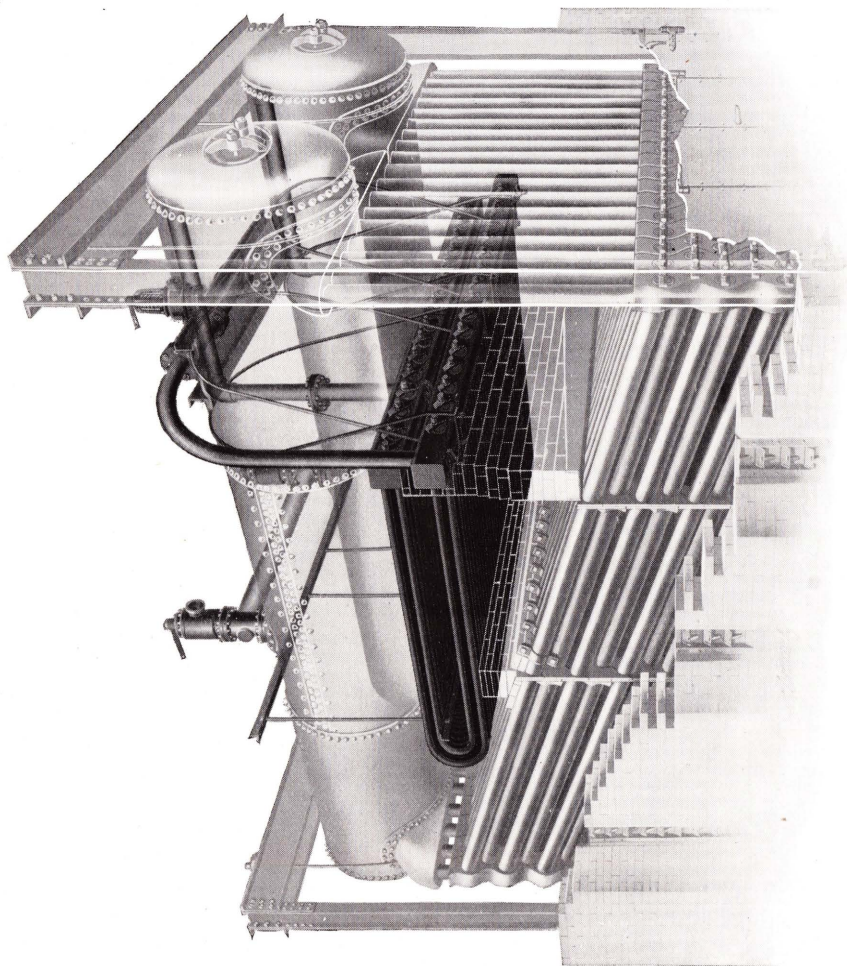
The gases are caused to make two passes over the heating surface by a vertical firebrick baffle built between, and held in position by the central curved tubes. Horizontal baffle shelves cause all portions of the heating surface to be swept by the gases.

The boiler is supported entirely free of the brickwork on cast-iron saddles under the mud drums, the saddles resting on masonry foundations.

The furnace front is of substantial construction. A full set of boiler fittings and fixtures are supplied with each boiler. Patented dusting doors and large doors in the front and side walls give full access to all parts of the setting for cleaning and inspection.

Since 1901, when Rust boilers were first built, there have been installed over a quarter of a million horse power of Rust boilers.

These boilers are giving eminently satisfactory results in steam plants of every description under widely differing conditions of service and with practically every known class of fuel.



BABCOCK & WILCOX PATENTED STEAM SUPERHEATER

THE BABCOCK & WILCOX STEAM SUPERHEATER

THE Babcock & Wilcox superheaters, as built for installation in all boilers of The Babcock & Wilcox Co.'s manufacture, are similar in design, location and operation. The construction is modified in certain details to meet the specific requirements of individual boilers.

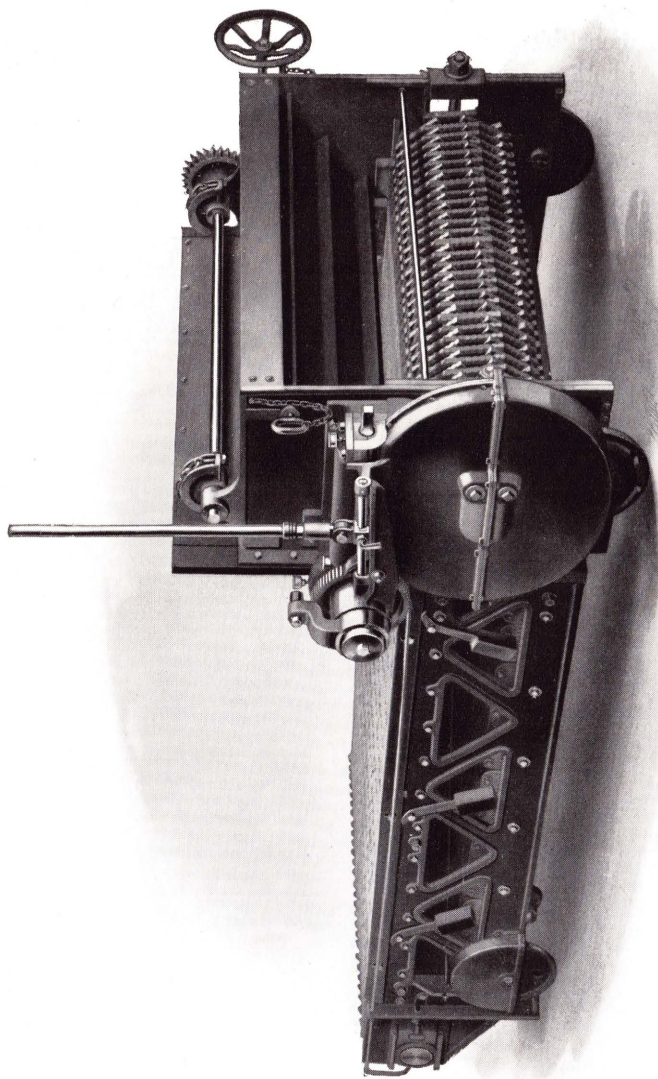
The superheater consists of two headers or manifolds, into which tubes bent to a U-shape are expanded. These headers are equipped with handholes and forged-steel hand-hole fittings, giving access to each tube end. As there is no rigid connection between the headers and because of the proper methods of suspension, there can be no strains set up in the apparatus by contraction or expansion. Each superheater is equipped with an independent steel-bodied, outside-spring, safety valve.

The superheater in all cases is located in the direct path of the products of combustion. The surfaces presented to these gases are smooth, offer the minimum resistance to the passage of the gases and the least opportunity for the adhesion of dust.

Steam is taken from the steam space of the boiler through the dry pipe, is introduced into the intake header and passes through the superheater tubes to the outlet header, to which the superheated steam connection from the boiler is made.

The advantages of the use of superheated steam have been too often discussed to need repetition here. The Babcock & Wilcox superheater may be installed in any boiler of The Babcock & Wilcox Co.'s manufacture without in any way interfering with the operation of the boiler and at a cost of operation and maintenance that is negligible.

Babcock & Wilcox superheaters were first manufactured in 1898. Since that time they have been installed in boilers of The Babcock & Wilcox Co.'s manufacture aggregating over 1,700,000 horse power. The remarkably successful performance of these superheaters is evidenced by the very large number of repeat orders.



BABCOCK & WILCOX CHAIN GRATE STOKER

THE BABCOCK & WILCOX CHAIN GRATE STOKER

THE Babcock & Wilcox chain grate stoker consists of a grate in the form of an endless chain passing at the front and rear of the boiler furnace over sprockets which are keyed to shafts carried by the stoker frame. The passage of the grate through the furnace is continuous. The stoker is driven through a worm wheel keyed to the front sprocket shaft. The fuel is fed uniformly to the front end of the grate under an adjustable stoker gate. The volatile gases are driven off on the forward portion of the grate under an ignition arch and are completely consumed in passing over the incandescent fuel bed before striking the boiler heating surface. Combustion is truly progressive. The ash and refuse are discharged automatically and continuously as the grate turns over the rear sprockets.

The form of the grate links is such as to allow proper admission of air for combustion. Suitable side seals and a bridge wall water box prevent the admission of large quantities of excess air. The bridge wall water box is connected into the water circulation of the boiler and is part of the regular stoker equipment.

The construction of the entire stoker is of such rugged character throughout as to permit continuous operation without the necessity of shut-downs for repair.

Since 1893, when the Babcock & Wilcox chain grate stoker was first built, these stokers have been operated with the coals for which experience has shown them to be particularly adapted with the most satisfactory results as to efficiency and capacity under widely varying conditions of load and with a negligible maintenance cost.

THE BABCOCK & WILCOX CO. PUBLISH
THE FOLLOWING BOOKS:

STEAM. ITS GENERATION AND USE
MARINE STEAM
THE STIRLING WATER TUBE BOILER
THE RUST WATER TUBE BOILER
STEAM SUPERHEATERS
CHAIN GRATE STOKERS

ANY OF THE ABOVE PUBLICATIONS MAY BE
OBTAINED UPON APPLICATION TO THE
NEAREST OF THE COMPANY'S BRANCH
OFFICES, THE ADDRESSES OF WHICH ARE
GIVEN ON PAGE 3

